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IS 2042 (2006): Insulating bricks [MTD 15: Refractories]



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भारतीय मानक
उष्मारोधित ईंटें — विशिष्टि
(दूसरा पुनरीक्षण)

Indian Standard
INSULATING BRICKS — SPECIFICATION
(*Second Revision*)

ICS 81.080

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 1

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Refractories Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1963 and later revised in 1972. In view of the experience gained since then in the manufacture and use of insulating bricks, the Committee decided to revise this standard. In this revision, provision has been made for stipulation of requirements in respect of refractoriness under load by the purchaser, in order to cater to the use of insulating bricks as load bearing component in furnace lining. For bricks to be used in direct contact with the heating elements or for a specific atmosphere in the furnace, the requirement in respect of iron oxide content has also been specified.

Thermal insulation considerably reduces the fuel consumption in a furnace. Bricks used for the purpose of insulation are made of diatomite, fireclay, or vermiculite, and other raw materials, and are characterized by their low thermal conductivity and low bulk density.

This standard contains 7.2 which calls for agreement between the purchaser and the manufacturer.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INSULATING BRICKS — SPECIFICATION

(*Second Revision*)

1 SCOPE

This standard covers requirements for insulating bricks.

2 REFERENCES

The following standards contain provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1387 : 1993	General requirements for the supply of metallurgical materials (<i>second revision</i>)
1527 : 1972	Methods of chemical analysis of high silica refractory materials (<i>first revision</i>)
1528	Methods of sampling and physical tests for refractory materials:
(Part 1) : 1980	Determination of pyrometric cone equivalent (PCE) or softening point (<i>second revision</i>)
(Part 2) : 1974	Determination of refractoriness under load (<i>first revision</i>)
(Part 6) : 1974	Determination of permanent change after reheating (<i>first revision</i>)
(Part 8) : 1974	Determination of apparent porosity (<i>first revision</i>)
(Part 12) : 1991	Determination of bulk density (<i>first revision</i>)
(Part 17) : 1993	Determination of cold crushing strength of shaped insulating refractory products
9490 : 1980	Method for determination of thermal conductivity of insulation materials water colorimeter method.

3 GRADES

The bricks shall be of three grades, namely:

- a) Grade A – Suitable for temperature up to 1 500°C
- b) Grade B – Suitable for temperature up to 1 250°C
- c) Grade C – Suitable for temperature up to 850°C

4 GENERAL REQUIREMENTS

4.1 General requirements for the supply of the bricks shall be as laid down in IS 1387.

4.2 The bricks shall be compact, of homogeneous texture and free from cracks, voids, pink or black cores and other flaws. They shall have sufficient mechanical strength and no soft corners.

5 TOLERANCE ON SIZE

Variations from specified dimensions, covering both warpage and shrinkage, shall be allowed to the extent of ± 2 percent or ± 1 mm, whichever is greater.

6 CHEMICAL COMPOSITION

If required by the purchaser, when the bricks are to be used in direct contact with the heating elements or for a specific atmosphere in the furnace, the iron oxide content, shall be not more than 1 percent when determined in accordance with IS 1527.

7 PHYSICAL REQUIREMENTS

7.1 The bricks shall conform to the requirements given in Table 1.

7.2 If required, the bricks shall be tested for refractoriness under load in accordance with the method given in IS 1528 (Part 2) except that a load of 0.5 kgf/cm² shall be applied instead of 2 kgf/cm². In that case the test requirements shall be as agreed to between the purchaser and the manufacturer.

8 SAMPLING

Representative samples shall be drawn according to the scheme of sampling given in IS 1528 (Part 1).

9 MARKING

9.1 The bricks and/or their wrappers shall be suitably marked with the manufacturer's name or trade-mark, and type.

9.2 BIS Certification Marking

The refractory bricks may also be marked with the Standard Mark.

Table 1 Physical Requirements for Insulating Bricks
(Clause 7.1)

Sl No.	Characteristic	Requirement			Methods of Test, Ref to IS
		Grade A (3)	Grade B (4)	Grade C (5)	
(1)	(2)				(6)
i)	Pyrometric cone equivalent, <i>Min</i>	1 717°C (see Note)	1640°C	—	1528 (Part 1)
ii)	Bulk density, g/cm ³ , <i>Max</i>	1.00	0.90	0.75	1528 (Part 12)
iii)	Apparent porosity, percent, <i>Min</i>	60	60	65	1528 (Part 8)
iv)	Cold crushing strength, kgf/cm ² , <i>Min</i>	20.0	15.0	7.0	1528 (Part 17)
v)	Permanent change after reheating for 12 h, <i>Max</i> at 1 500°C	–1.5 percent at 1 250°C	–1.5 percent at 850°C	–2.0 percent	1528 (Part 6)
vi)	Thermal conductivity at 600°C w/mk at hot face, <i>Max</i>	0.52	0.35	0.28	9490

NOTE — In the case of silica base Type 1 bricks, the pyrometric cone equivalent shall be Standard Pyrometric Cone (ASTM) No. 28, *Min*.

9.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and Rules and Regulations made thereunder. The details

of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Amendments Issued Since Publication

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